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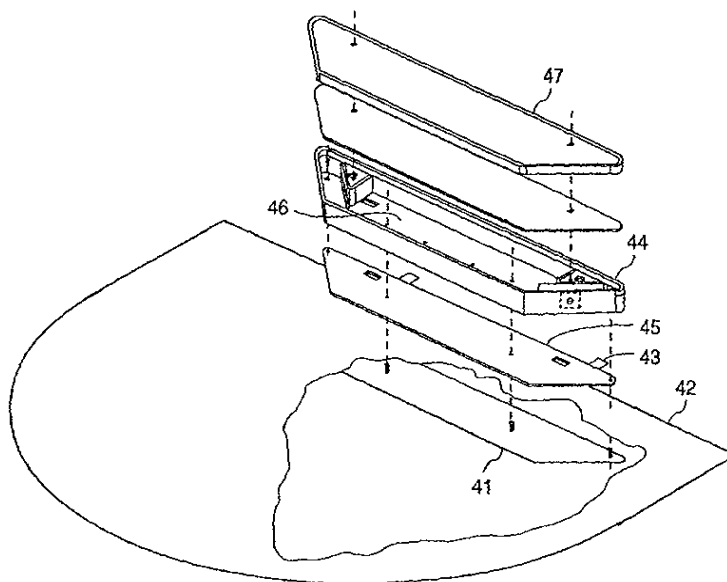
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- (71) Applicant (for all designated States except US): ADD-VISION, INC. [US/US]; 165 Spring Hill Drive, Grass Valley, CA 95945 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): KLINE, Richard [US/US]; 16713 Scottway Drive, Grass Valley, CA 95949
- (US). JOHNSTON, Rick, A. [US/US]; P.O. Box 415, Cedar Ridge, CA 95924 (US). WILKINSON, Matthew [US/US]; 573 Hacienda Drive, Scotts Valley, CA 95066 (US). MOHLE, Don [US/US]; 2450 Begonia Place, Santa Cruz, CA 95062 (US). MARSHALL, Frank [US/US]; 10372 Cement Hill, Nevada City, CA 95959 (US).
- (74) Agents: McPAUL, Georgina et al.; Pillsbury Winthrop LLP, 50 Fremont Street, San Francisco, CA 94105 (US).
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[Continued on next page]

(54) Title: GRAPHIC SIGN DISPLAY WITH INTEGRAL ELECTROLUMINESCENT LAMP



(57) Abstract: Described is a floor mounted graphic display comprising an electroluminescent lamp assembly, a graphic overlay which is positioned over the electroluminescent lamp, a moisture barrier (45) surrounding the electroluminescent lamp and the graphic overlay, a mounting plate (41) which is incorporated into the electroluminescent lamp and the graphic overlay, a controller housing (44) which is attached with the mounting plate (41) and a controller which is situated in the controller housing (44).

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GRAPHIC SIGN DISPLAY WITH INTEGRAL ELECTROLUMINESCENT LAMP.

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Field of the Invention

The present invention is directed to floor displays. More specifically it is directed to an electroluminescent floor display which incorporates an integrated controller and is
10 designed to minimize wear and damage in normal environments. The floor graphic may be of any size shape color and may contain any type of electroluminescent lamp and overlay. The primary use of this type of display is for advertising but may be used in other applications such as equipment operation instructions, exit\entrance identification or hazard warnings.

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Floor mounted graphic displays are previously known but these have suffered the problems associated with having a controller which is independent of the lamp display system. Ordinarily the displays have a strip of circuitry connecting the display assembly with the controller. As a result the displays have suffered damage from
20 floor washing and other everyday activities.

Summary of the Invention

25 The invention, in one embodiment, comprises an electroluminescent lamp assembly, which incorporates an electroluminescent lamp, a graphic overlay positioned over the electroluminescent lamp and, in a preferred embodiment, a moisture barrier surrounding the electroluminescent lamp and the graphic overlay. A mounting plate is incorporated into the electroluminescent lamp, the graphic overlay and the moisture
30 barrier. In a preferred embodiment the mounting plate extends through the electroluminescent lamp, the graphic overlay and the moisture barrier and is attached with a controller housing. A controller is situated in the controller housing. The controller is connected with the electroluminescent lamp by means of a circuit and the circuit is primarily positioned within the perimeter of the moisture barrier.

Brief Description of the Drawings

The invention will be better understood by reference to the appended figures, in which:

- 5 Figure 1 shows one embodiment of the floor display.
- Figure 2 shows a second embodiment of the floor display.
- Figure 3 shows a third embodiment of the floor display.
- Figure 4 shows the integrated controller of one embodiment of the present invention.

10 Detailed Description of the Invention

The invention will now be described with reference to preferred embodiments and the appended figures.

- 15 Figure 1 depicts one embodiment of the invention which comprises the following basic elements. Two or more elements may be combined into one layer. Graphic overlay layer 10 incorporates the advertising or other graphics to be illuminated, and creates the first stages of moisture resistance. Adhesive layer 11 adheres the graphic overlay to the electroluminescent lamp layer 13. Electroluminescent lamp layer 13
- 20 ordinarily incorporates a layer of indium tin oxide, making it a very good moisture barrier. Optional safety laminate layer 14 adheres to the lamp and guards against shock, protects conductive components, and is beginning of lower layer moisture barrier. A second adhesive layer adheres the safety laminate layer 14 to moisture barrier 15. Moisture barrier 15 protects against moisture migration and reduces
- 25 moisture vapor transmission rate.

- As an example, another embodiment of the floor graphic invention is shown in Figure 2. This embodiment comprises the following elements. Graphic overlay with incorporated electroluminescent lamp layer 21, comprises the advertising graphics to
- 30 be illuminated as well as the illuminating lamp layer and can include an upper moisture barrier. Safety laminate 24 is adhered to the graphic overlay electroluminescent lamp layer and guards against shock, protects conductive components, and aids in moisture resistance. Adhesive adheres safety laminate 24 to

moisture barrier 25. Moisture barrier 25 protects against moisture migration and reduces moisture vapor transmission rate.

As a further example, another embodiment of the invention is shown in Figure 3 and
5 comprises the following elements. Clear vinyl overlamine layer 32 comprises a textured material to protect the lamp and graphics, and to improve moisture resistance. Adhesive laminates the clear vinyl overlamine to the graphic overlay with incorporated lamp 33. The safety laminate layer 34 is adhered to or otherwise attached with the graphic overlay with incorporated lamp and guards against shock,
10 protects conductive components, and aids in moisture resistance. Adhesive adheres safety laminate 34 to moisture barrier 35. Moisture barrier 35 protects against moisture migration, and reduces moisture vapor transmission rate.

Figure 4 shows the integrated controller of the present invention. In this embodiment
15 mounting plate 41 is incorporated into graphic and electroluminescent lamp layer 42. Electroluminescent circuit ends 43 protrude slightly from controller housing 44. An optional moisture barrier 45 is included in the controller housing 44. An optional battery holder 46 is included in housing 44. Lid 47 closes off housing 44 and provides moisture protection.

20 In previous embodiments, the controller assembly operated from a separate, remote location near available AC power, situated up off the floor so as to be less susceptible to moisture. This remote controller was connected to the lamp tail via an exposed and vulnerable ribbon cable. In one embodiment, the controller of the present invention
25 remedies many known controller problems by substituting a remotely programmable computer in place of the microprocessor. This computer, called the motherboard, allows the controller to generically control any electroluminescent display system, and it permits the controller to be immediately reusable, without movement, for any subsequent display. The motherboard is remotely programmable either by a series of
30 instructions that is carried on board (by various means) the display system itself, or by instructions that are downloaded into the controller from a wireless device and/or a telephonic connection. In this embodiment the controller contains a motherboard, a power supply, and various inverters and waveform conditioners. It may also contain inbound/outbound communications facilities, motion sensing apparatus, ambient

lighting detection, scanning/flatlining techniques, a floppy disk reader and internal storage devices.

5 The controller assembly of the present invention has a water-resistant housing. This allows the controller to better withstand the cleaning processes found in most typical installation environments. In another unique controller design change the controller housing has been incorporated into the overall lamp and graphic assembly via a "mounting plate" that comes up through the lamp\graphics and controller housing and is secured together as one assembly. This entire assembled unit is then adhered to the
10 floor as one piece. This adds great structural integrity to the entire unit when mounted. The new controller configuration has been adapted to accept batteries and or typical AC power. Also added to the controller has been the incorporation of "motion sensors" which increase the useful life of the batteries as well as the lamp life. The motion sensor also creates an element of surprise, by what would appear to be a
15 random commencement of the light animation cycle.

The new integral design of the "lamp circuit ends" (tail section) makes the tail section more secure by incorporating it inside of the lamp perimeter rather than completely protruding off the edge. By protecting the tail-electronics connection within the
20 waterproof controller assembly and eliminating the long ribbon cable, we have eliminated the tail's susceptibility to structural stress and moisture.

In one embodiment the moisture barrier is composed of vinyl. In a preferred embodiment the moisture barrier is composed of metalized polypropylene. In another
25 preferred embodiment the moisture barrier is composed of a layer construction of polyesters with metalized coatings. In a most preferred embodiment a metalized polyester layer is positioned between layers of permanent and removable adhesives.

30 The lamp graphics and controller module are assembled as one unit and are secured together which increases the overall structural integrity of the product increases the protection of the circuitry connecting the controller with the electroluminescent lamp assembly.

In one embodiment the graphics are printed on the face of a heat stabilized indium tin oxide polyester. The complete lamp is then printed on the reverse side or the conductive indium tin oxide side of the printed graphics in the chosen areas to be illuminated, eliminating the separate graphic layer. The product is completed with a safety laminate, adhesive \ moisture barrier, and a clear vinyl overlamine on the viewing side of the product.

Optionally the circuitry tail connecting the controller with the electroluminescent lamp can be incorporated into the perimeter of the moisture barrier rather than protruding from the end of the assembly. The new design configures the circuitry tail into the graphics and it is then incorporated into the controller housing when assembled. This adds overall structural integrity to the completed product and protects the circuitry tail making it less vulnerable to damage. In one embodiment the controllers are encased in a water-resistant housing which enhances durability.

Incorporating the Graphics and Lamp adds structural integrity. Motion sensors adds effective life to the batteries and lamp In addition the new controller design improves battery life and accepts touch switch input, initiating audio output. In one embodiment the touch switch actuations are counted and reported to service personnel.

Although the description above contains the details of preferred embodiments, these should not be construed as limiting the scope of the invention, but as merely illustrative of the invention. Indeed, variations of the invention will be readily apparent to those skilled in the art and also fall within the scope of the invention. Thus the appended claims and their legal equivalents should determine the scope of the invention.

We claim:

1. A floor mounted graphic display comprising:
 - 5 an electroluminescent lamp assembly;
 - a controller housing which is integrated into the electroluminescent lamp assembly; and,
 - a controller.
- 10 2. The floor mounted graphic display of claim 1, wherein the electroluminescent lamp assembly comprises an electroluminescent lamp and a graphic overlay.
3. The floor mounted graphic display of claim 1, a mounting plate is incorporated into the electroluminescent lamp and the controller housing is attached with the
15 mounting plate.
4. The floor mounted graphic display of claim 1, wherein the controller is powered by either battery or AC power.
- 20 5. The floor mounted graphic display of claim 1, wherein the controller includes a motion sensor.
6. The floor mounted graphic display of claim 1, wherein the controller housing is waterproof.
25
7. The floor mounted graphic display of claim 1, wherein the electroluminescent assembly is surrounded by a moisture barrier.
8. The floor mounted graphic display of claim 1, wherein the controller and the
30 electroluminescent lamp assembly are connected by means of a circuit and wherein the circuit is positioned within the perimeter of the electroluminescent lamp assembly.
9. A floor mounted graphic display comprising:
 - an electroluminescent lamp;

- a graphic overlay positioned over the electroluminescent lamp;
 - a moisture barrier surrounding the electroluminescent lamp and the graphic overlay;
 - a mounting plate which is incorporated into the electroluminescent lamp, the
 - 5 graphic overlay and the moisture barrier;
 - a controller housing which is attached with the mounting plate;
 - a controller which is situated in the controller housing.
10. The floor mounted graphic display of claim 9 wherein the controller is connected
- 10 with the electroluminescent lamp by means of a circuit and the circuit is primarily positioned within the perimeter of the moisture barrier.

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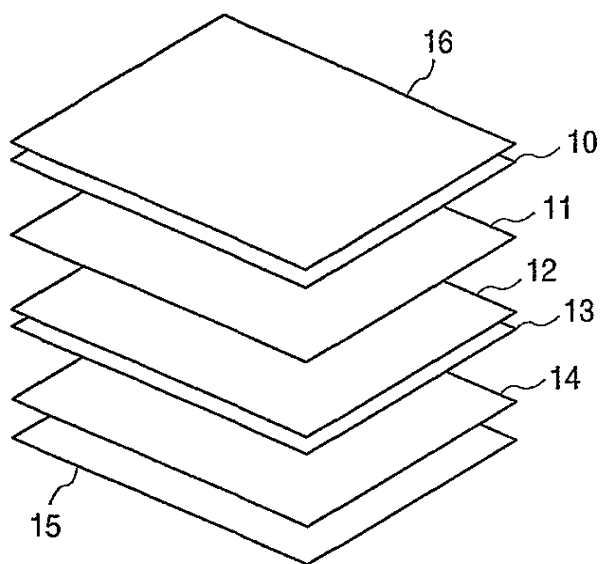


FIG. 1

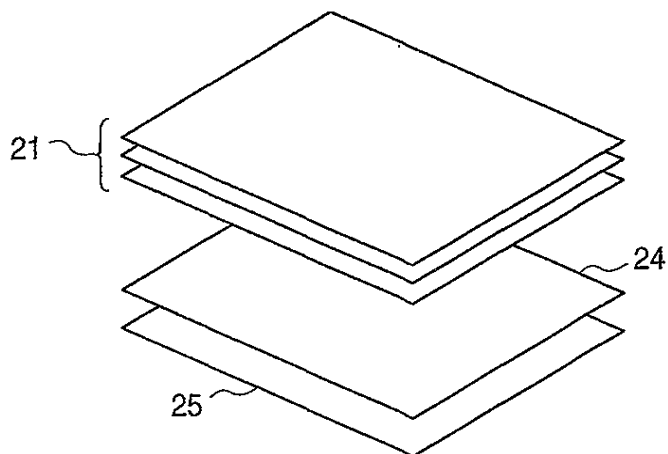


FIG. 2

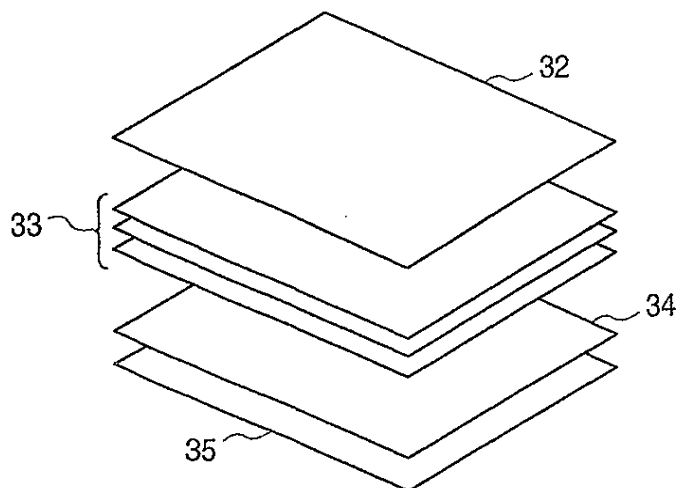


FIG. 3

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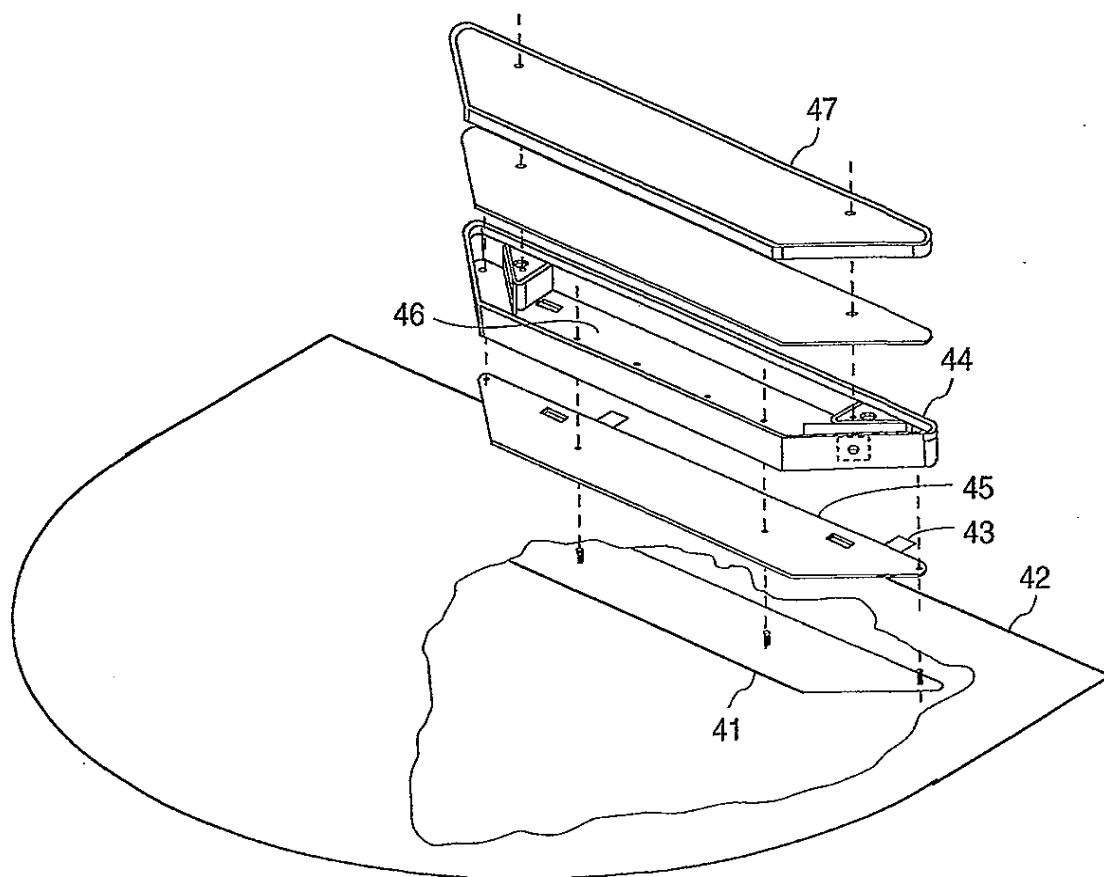


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.
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A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :G02F 1/1335

US CL :359/40, 49; 350/334, 345; 315/169.3

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 359/40, 49; 350/334, 345; 315/169.3

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,161,041 A (Abileah et al) 03 November 1992 (03.11.1992), entire document.	1-10

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
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"P" document published prior to the international filing date but later than the priority date claimed	

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Box PCT
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Facsimile No. (703) 305-3230

Authorized officer

CHUC TRAN

Telephone No. (703) 308-0956